

# Equations

Honors and CP Physics

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## Kinematics:

$$\bar{v} = \frac{\Delta \bar{x}}{\Delta t} \quad (1)$$

$$\bar{a} = \frac{\Delta \bar{v}}{\Delta t} \quad (2)$$

$$\Delta x = v_{ix}t + \frac{1}{2}a_xt^2 \quad (3)$$

$$v_{fx}^2 = v_{ix}^2 + 2a_x\Delta x \quad (4)$$

$$v_{fx} = v_{ix} + a_xt \quad (5)$$

$$\Delta y = v_{iy}t + \frac{1}{2}a_gt^2 \quad (6)$$

$$v_{fy}^2 = v_{iy}^2 + 2a_g\Delta y \quad (7)$$

$$v_{fy} = v_{iy} + a_gt \quad (8)$$

## Momentum:

$$\bar{p} = m\bar{v} \quad (9)$$

$$\bar{J} = \Delta \bar{p} \quad (10)$$

$$\bar{F}\Delta t = m\Delta \bar{v} \quad (11)$$

$$m_1v_{1i} + m_2v_{2i} = m_1v_{1f} + m_2v_{2f} \quad (12)$$

$$(m_1 + m_2)\bar{v}_i = m_1v_{1f} + m_2v_{2f} \quad (13)$$

$$m_1v_{1i} + m_2v_{2i} = (m_1 + m_2)\bar{v}_f \quad (14)$$

## Forces:

$$\Sigma \bar{F} = m\bar{a} \quad (15)$$

$$F_f = \mu F_N \quad (16)$$